

REVIEWS.

SWARTLAND AND SANDVELD. By W. J. Talbot, Cape Town, Oxford University Press, 1947. 10/6d. net.

It is a truism that all human progress and civilisation is dependent on the ability of the community to provide sufficient food. On the agriculturalist rests the whole structure. Agriculture itself is dependent on the soil and its continuance on the preservation of that soil. Loss of soil means a permanent loss of food; if extensive it may result in the downfall of human activities.

The sub-title of this volume, "A Survey of Land Utilisation and Soil Erosion in the Western Lowland of the Cape Province" explains its purpose. It is a study of one of the important grain-producing areas of South Africa and of this area it presents a most unsatisfactory picture. As a result of ignorance, carelessness or mistaken desires for immediate gain, soil erosion in one or other of its forms has affected practically the whole of the cultivated area and in parts has become really severe.

Working under the auspices of the Social and Economic Planning Council, Professor Talbot has written this book in the form of a report. As such it may well serve as a model of objective scientific observation and deduction without a trace of propaganda.

The area covered is the lowland region of the western Cape between Table Bay in the south and Moorreesburg and Saldanha Bay in the north. The book is divided into four chapters, the first being a description of the area, its configuration, climate and vegetation. Special mention must be made of the treatment of rainfall and the most striking maps illustrating not only its amount and distribution but also its reliability. This last is a most important factor in land utilisation in regions which have rainfalls near the lower limit possible for crops. The second chapter deals with Soil Genesis and Degeneration and is admirably clear. Theoretical matter is throughout related to local conditions and illustrated by local examples. The third and longest chapter is on soil erosion in the area itself and has descriptions of the varied forms that occur and their distribution and frequency. In all cases these are clearly related to the causative factors. The final chapter is devoted to conservation both as it should be and as it has been aimed at. Where conservation attempts have failed the reasons are clearly set out.

The summarisation at the end paints a picture of present conditions that can only be described as disastrous but the author does hold out a

real hope in a suggested conservation policy which, if implemented at once, does promise salvation for the agricultural future of the region.

The volume is very fully illustrated by excellent photographs, very clear diagrams and a number of clear maps. Several of the maps are based on aerial photographs. A feature of the book is the way the illustrations are used as a visual addition to and extension of the matter in the text. This enables the author to present a full picture but one nowhere overloaded with detail. At no time does the reader feel oppressed by masses of examples but rather has the attitude of asking for more.

The book is written in clear, non-technical language. It is very well produced and remarkably free from errors. It is one that should have a very wide appeal. All who are interested in the future of the country should study it if only because it is only by the pressure of public opinion that the conservation schemes proposed here can be brought to actuality. Without them this grain-producing area is liable to become a useless waste.

R. S. ADAMSON.

PLANTS AND PLANT SCIENCE IN LATIN AMERICA. Edited by Frans Verdoorn. Waltham, Mass., U.S.A., the Chronica Botanica Co.; Johannesburg, Central News Agency, Ltd. \$6.00. xl+ 384 pp., 83 pl. and text-illustrations. 1945. (A new series of Plant Science Books, vol. XVI.)

This impressive volume is a collection of essays and articles by many authors on almost every conceivable aspect of plant life, indigenous and cultivated, in what is called, for lack of a better phrase, Latin America, from Mexico to Cape Horn, including the West Indies and outlying islands. There are comprehensive chapters on Types of Vegetation (Johnston and Smith), Economic Botany (Fosberg), History (Pennell), and Problems of Tropical American Agriculture (Popenoe), and a large number of shorter articles on more special aspects. A valuable feature, typical of the aims of the Chronica Botanica editors, is the reference section. For instance, Lanjouw contributes an index to the Location of Central and South American Botanical Collections; there is a supplement which gives the names and addresses of botanical institutions, stations, museums, gardens, societies and commissions; there is a comprehensive bibliography and the indexes are excellent.

Several chapters can be read with profit in countries with similar problems, such as South Africa. For instance, Coolidge contributes Notes on Nature Conservation which show that in Latin America, just as in the Union, there is more aspiration than achievement in this direction. Bennett's contribution on Soil Conservation is all too reminiscent of his treatment of the parallel problem in South Africa.

Special praise may be given to the plates which are of a high degree of interest, and to the text-illustrations, maps, ornamental headings and end-papers. Dr. Verdoorn's own essay on *The Plant Scientist in the World's Turmoils* enables him to set forth his creed of international understanding and co-operation which is the mainspring of so much of his work through the *Chronica Botanica* organisation; and this volume aims at promoting inter-American relations. It is an indispensable source of information and guidance in the botanical and agricultural fields of the southern three-quarters of the New World; and Dr. Verdoorn is to be congratulated and admired for the way in which he has organised his team of collaborators, and on the general high standard of the book as a whole. The greater part of it is in English, with some chapters in Spanish and French.

R. H. COMPTON.

Chronica Botanica Publications (Waltham, Mass., U.S.A., *Chronica Botanica Co.*; Johannesburg, *Central News Agency*).

Merrilleana: A Selection from the General Writings of Elmer Drew Merrill. C.B., Vol. X, Nos. 3/4, pp. 127-394. 1946. \$4.00.

Nobody has contributed more to the knowledge of the floras of the Pacific and the Far East than Dr. Merrill. His innumerable studies have been published during a lifetime of administrative work in control of some of the greatest American botanical institutions. His influence has been felt in every aspect of historical botany, plant systematics and phytogeography in the United States, and the value of his work has been recognised by honorary fellowships and distinctions in many other countries. His writings have not been solely technical, and in the present volume there have been collected a number of his articles on the general aspects of his subject, all of interest to the student and many to the lay reader as well. Such are his studies of domesticated plants in relation to the diffusion of cultures, the connexion between the distribution of plants and of their local names, the problem of the so-called lost continents of Atlantis and Mu, and the full and instructive accounts of the exploration of Mount Halcon. Throughout one feels the vitality of the author and his keen sense of the intimate relation between botanical work and daily life. A valuable and stimulating record of the work and thought of an essentially human botanist, whose seventieth birthday the volume commemorates.

ARBER, DR. AGNES. Goethe's Botany. C.B., Vol. X, No. 2, pp. 63-126. 1946. \$2.00.

A translation of Goethe's "Versuch die Metamorphose der Pflanzen

zu erklären," 1790, and a reprint of his ode "Die Natur," 1782, with a new translation. Dr. Arber in an introductory essay attempts an estimate of Goethe's enthusiastic but rather amateur studies and the poetical and abstract bias which carried him into the realms of nature-philosophy. His influence on the botanical thought of his day was profound, but led to what Sachs called "inconceivable aberrations" among his followers. Dr. Arber thinks that Goethe was "a great biologist who, in the long run, overstepped the bounds of science."

RAFINESQUE, C. S. *A Life of Travels*. C.B., Vol. VIII, No. 2, pp. 291-360. 1944. \$2.50.

A reprint of the rare autobiography (of which only about twenty copies are known to exist) of this versatile but erratic traveller and naturalist (1783-1840), who published about 900 papers, mainly on North American subjects of the most varied kind. Dr. Merrill, who has done much to revive interest in this curious and exasperating character, contributes a foreword in which he attempts to give a more appreciative estimate of Rafinesque's pioneer work than has been current hitherto.

JACK, HOMER A. *Biological Field Stations of the World*. C.B., Vol. IX, No. 1, pp. 1-74. 1945. \$2.50.

A comprehensive list of biological field stations in all parts of the world, with their functions, publications, equipment, history and other relevant particulars. The compilation of this list represents an enormous amount of work, travel and enquiry, for which gratitude is owed to Dr. Jack, whose introductory chapters on topics connected with field stations are of great value for their interest and guidance.

WYMAN, DONALD. *The Arboretums and Botanical Gardens of North America*. C.B., Vol. X, Nos. 5/6, pp. 395-498. 1947. \$1.50.

This book can be strongly recommended to anyone who has the ambition of founding or endowing an arboretum or botanic garden, to anyone who is in control of such an establishment, and to anyone who wishes to know more about the various types of institutions of this kind. It is primarily a list of the North American examples, ranging from the few great institutions such as the Arnold Arboretum, "America's Greatest Garden," with its endowment of three and a half million dollars and an operating budget of \$90,000, the New York Botanic Garden (endowment \$3,500,000, budget \$400,000), the Missouri Botanic Garden (endowment \$5,000,000, budget \$150,000-\$200,000), Montreal Botanic Garden (budget \$165,000), down to the numerous small establishments, often converted private arboreta with a mere handful of employees.

Details are given of the aims and functions of these institutions—scientific, educational, aesthetic—and of their administration.

Apart from this reference section the book contains a remarkable collection of illustrations of botanic gardens, old and modern, in many parts of the world, many of them of rarity and curious interest; an informative introduction on the problems involved in establishing an arboretum or botanic garden and the methods which should be adopted; a bibliography; an index to small collections of special plants; as well as several other features. Dr. Wyman deserves cordial thanks for this valuable volume.

HOWARD, WALTER L. Luther Burbank, a Victim of Hero Worship. C.B., Vol. IX, Nos. 5/6, pp. 299-522. 1945/6. \$3.75.

L. H. Bailey gave what is perhaps the fairest picture of Luther Burbank when he said: "He is an honest, straightforward, careful, inquisitive, persistent man. He believes that causes produce results. His plants are the result of downright, earnest, long-continued effort. He earns them. He has no other magic than that of patient enquiry, abiding enthusiasm, an unprejudiced mind, and a remarkably acute judgment of the merits and capabilities of plants."

But Burbank has been converted by the methods of publicity, journalism, exploitation, idealisation, bigotry and ballyhoo into a fantastic figure—national hero, genius, wizard, charlatan, fraud, atheist, and goodness knows what besides. To call him the "victim of hero-worship" is to mention only part of his victimisation. Dr. Howard's study of the man and his achievements, though somewhat over-elaborate, is the best attempt that has been made to arrive at a just estimate of Burbank. It will be read with sympathy for the fate which has befallen this essentially simple character, whose orthodox and time-honoured methods of selection, so thoroughly applied, have led to such unenviable notoriety.

R. H. COMPTON.

K. STARR CHESTER. The Nature and Prevention of the Cereal Rusts as Exemplified in the Leaf Rust of Wheat. Waltham, Mass., the Chronica Botanica Co.; Johannesburg, Central News Agency, Ltd. 1946. pp. 269. Figs. 11. Price in U.S. 5.00 dollars.

Among its many excellent features, this book maintains the tradition of the *Annales Cryptogamici et Phytopathologici* that the author should be a recognised authority on the subject he writes about; it gives a welcome summary of Russian literature; and it describes those recent advances which have averted rust-induced wheat famines of the sort that were associated with World War I.

A purely parochial objection is that the book is primarily concerned with leaf rust, while South Africans would have preferred more about stem rust. But in this country we should study the cereal rusts in all their aspects, because rust is incomparably the greatest plant disease problem here. For it is rust that stops us growing wheat as a summer crop in the summer-rainfall area—the only area likely to give us a crop adequate for the country's needs—and gives us the official classification of wheat as a "winter cereal," a classification which must surprise those who know the blistering summer heat that wheat stands in much of N. America and Eurasia.

The printing and binding of the book conform with previous volumes in the series, which is to say they are excellent.

J. E. VAN DER PLANK.

J. B. HUTCHINSON, R. S. SILOW and S. G. STEPHENS. *The Evolution of Gossypium and the Differentiation of the Cultivated Cottons*. Oxford University Press. 1947.

Alterations in the policy of the Empire Cotton Growing Corporation and its decision to concentrate its research activities largely in Uganda and the basin of the Upper Nile have meant the passing of the Cotton Research Station in Trinidad, and, nearer home, the closing of the long familiar station at Barberton in the Transvaal. These changes, though clearly matters of the Corporation's policy, have not been made without regrets, felt amongst a wider public than the staffs of the stations themselves, for the high standard of the work at each of them had lead them to be held in very high esteem by geneticists, agriculturalists and botanists alike. "Tis an ill wind" however, for the closing of the Trinidad station has lead to the preparation of this very excellent little book. It is the result of twenty years of patient research and is one of those delightful biological syntheses in the field of genetics which we are more accustomed to expect from the pen of an author with a short-lived insect as experimental material.

Some years ago Ford and Huxley produced a similar book, dealing mainly with Cyclopeans, in which they showed how a mutant gene could only be considered in relation to its environment of genes and not as having effect on one character only. To find a similar thesis expounded by experimenters having the annual cotton as their most favourable material is a tribute surely to the immense amount of work done by the geneticists of the Corporation.

The authors make a further significant contribution in that they deal with a cultivated genus, which, like so many others, has long been a puzzle to the systematist; puzzling in its multiplicity of forms which in

the classic systematics is so apt to lead to a multiplicity of names of little help to the practical cotton grower. Here with all the ideas of the "new systematics" made usable through the accumulated genetical and cytological data, the authors are able to produce a simple, straightforward, workable classification without even having to make recourse to the new terms, coenospecies, ecospecies and the like, though they are able to equate their species and varieties to these newer terms.

Gossypium is here defined as including *Ingenhouzia*, *Thurberia*, *Selera*, *Erioxylum* and *Sturtia* and the authors note that "their inclusion in *Gossypium* has been established by genetic and cytological research."

In the chapters of part two and part three much fascinating information regarding the history of cotton as a cultivated crop dating backwards to some 3,000 years B.C. is given and forms almost a chapter on what might be termed the prehistory of Cotton in the Old and New Worlds, for of course these earlier references are based on records other than the written word—sometimes just a fragment of age-old cloth.

Part four, entitled "The Significance of *Gossypium* in Evolutionary Studies" is the part where the valuation of the genetic studies of cotton from the point of view of the general theory of evolution receives its treatment and will be regarded by many as the most valuable contribution made by this work. It is amongst the few attempts yet possible to evaluate the newer theories of cyto-genetics in terms of a genus whose behaviour experimentally has been well worked out. The implications are thoroughly considered and the final paragraph is worth quoting: "All the available evidence supports the view here put forward that the domestication and distribution of crop plants, and the development and conservation of variability within them, are intimately bound up with the origin and spread of civilisation, and that the whole interrelated complex, including civilised man, his domestic animals and his crop plants, have grown from a single root and spread to the New World by trans-pacific migration."

H. B. GILLILAND.